

Characterization of n-dimensional Kerr-de Sitter at null infinity and its limit spacetimes.

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Abstract

We derive the structure of \mathcal{I} of the n-dimensional Kerr-de Sitter family of spacetimes as well as the corresponding initial data, whose initial value problem is known to be well-posed in even dimensions. The initial data shares the same essential features as in the 4-d case which in turn are known to be closely related to a spacetime characterization of Kerr-de Sitter. In all dimensions the data is singular at precisely two isolated points, which happen to be related to the intersection of the Killing horizons with \mathcal{I} . We also show that there exist various limits for the rotation parameters going to infinity, that produce new families of spacetimes. We relate the existence of these limits with the conformal properties of the data at \mathcal{I} . This improves a known result in 4-d and extends it to all higher dimensions.